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Canning Fruits and Vegetables

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FRUIT BRANCH
and
EXPERIMENTAL FARMS BRANCH

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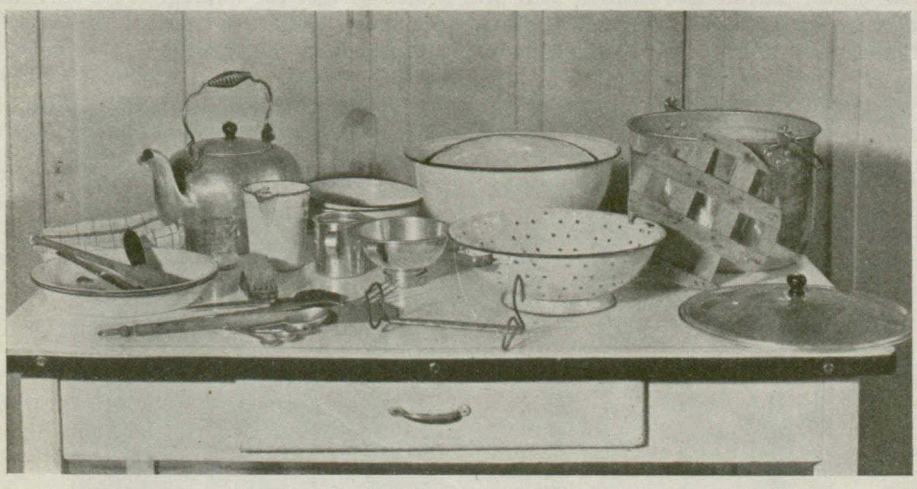
Canning Fruits and Vegetables*

OUR present day knowledge of nutrition, and particularly of the value of minerals, vitamins and roughage in our daily diet, leads us to give Fruits and Vegetables their true place in the menu. At certain seasons of the year, our Canadian Fruits and Vegetables are unobtainable in their fresh state so we must rely on canned foods. There is nothing more satisfying to a housewife than a pantry shelf well stocked with home-canned Fruit and Vegetables.

HOW CANNING PRESERVES FOOD

If food products are left in their natural state, most of them spoil in a few days—some in a few hours, owing to the growth on their surface or in their tissues of bacteria, mould or yeasts. If such organisms can be destroyed and the entrance of other organisms prevented, the food can be kept in good condition indefinitely. Sufficient heat for a sufficient length of time will destroy any form of life. Therefore successful canning depends on destroying all microscopic life and using air-tight containers which protect from reinfection. Our aim in canning fruit and vegetables is to assure this result while preserving natural shape, colour and fresh flavour. Safe canning depends on strict attention to every step in the process. Can *Fresh* Vegetables and Fruit. The fresher they are the better will be the finished product, and the smaller the chance of failure. For best results can Fruits and Vegetables the day they are gathered.



Simple equipment for home canning.

EQUIPMENT

No equipment is needed other than that found in the ordinary kitchen. Sharp knives—preferably stainless steel, a colander, bowls, measuring cups, enamel pie plates, wooden spoons, a wide mouthed funnel for filling jars, and a jar lifter to save burned fingers in lifting jars from the sterilizer. The sterilizer may be the common wash boiler, the steam pressure cooker, or the oven.

* This bulletin replaces Experimental Farms Bulletin No. 77 and Fruit Branch Pamphlet No. 109.

1. Steam Pressure Cooker

This consists of a heavy container equipped with tight cover fastened in place with bolts, and with a pressure gauge, pet cock and safety valve. Because of the pressure a higher temperature may be reached and the time of sterilization shortened.

2. Hot Water Bath Canner

A hot water bath outfit may be any container of sufficient depth to allow the jars to be covered with water while standing on a false bottom which allows circulation of water under the jars. It must also have a tight fitting cover. Special kettles may be bought for the purpose having a wire rack with handles for lifting in and out of the boiling water, but the wash boiler or other deep pot may be fitted with a wooden rack and will answer the purpose nicely.

3. Oven

This method may be used for small fruits and tomatoes. An oven with thermostat control is very satisfactory.

4. Steam Cooker

The steam is generated below and circulates around the jars, giving an even temperature. The time of sterilization is longer with this type of canner.

5. Open Kettle

JARS

A jar for use in canning should have a smooth rim and good fitting cover, to furnish a perfect seal. Test each jar before you use it. See that it is not cracked. See that there are no chips in the rim of jar or cover. Fill the jars with water, adjust the rubber, seal and invert to test for leakage. Be sure that the wire spring of a spring top jar springs into position with a snap. New metal rings should replace those which have become cracked or corroded.

Types of jars

JAR RUBBERS

Jar rubbers are a very important part of canning equipment. Buy fresh rubbers each season. Never use last year's rubbers. Twelve rubbers are cheaper than one jar of fruit. To test—first bend double—an old rubber will crack. Then stretch—a new rubber will spring back to its original size. Be sure to have the type of rubber which suits the type of jar you are using. Wide rubbers fit spring top jars. Narrow rubbers fit screw tops.

PROCESSES

1. Cold Pack Method.—By this method the food is packed into sterilized jars while raw and cold, covered with hot liquid and partially sealed—then sterilized.

2. Hot Pack Method.—By this method the food is subjected to a short precooking and packed hot—thus requiring shorter time for heat penetration and in some cases allowing more vegetable to be packed in the jar. With vegetables such as corn or greens the centre of the filled jar reaches sterilization temperature from thirty to fifty minutes sooner than when packed cold.

3. Open Kettle Method.—While this method of cooking fruit with sugar in an open kettle is a common one it is not recommended for canning fruits and should never be used for vegetables. Jams and marmalades are done in the open kettle.

In canning fruits by the open kettle method wash them carefully and cook in sugar syrup until tender. Pack while boiling hot into clean hot sterilized jars, partially seal and process for five minutes. Then seal.

4. Raw Canning.—Raspberries, strawberries, or rhubarb may be canned successfully by what is known as the raw canning method. Pack in jars. Cover with boiling syrup, place on newspaper in a tub and pour in enough boiling water to cover the jars 3 inches over the top. Place a blanket or rug over the tub and leave until cold. In pouring in boiling water care should be taken not to pour directly on the jars.

GRADING OR SORTING

Uniformity of size and maturity makes a more attractive product. It is well to spend the extra time.

WASHING

All Fruit and Vegetables should be thoroughly washed until all soil is removed. Lift them from the water instead of draining it off. A small brush is useful for cleaning Vegetables.

TO PREVENT DISCOLORATION

Such fruits as peaches, pears and apples should be dropped in a brine of 1 teaspoon of salt to 1 quart cold water as soon as peeled, to prevent discoloration.

PRE-COOKING

To shrink vegetables and allow a better pack and to insure a quick and thorough heat penetration, vegetables are prepared for serving, covered with boiling water and brought to boiling point over the fire, then packed hot into jars and covered with the boiling water in which they were heated (*see* table for vegetables). Beets are precooked before peeling, then dipped in cold water to loosen skins.

BLANCHING

This process is used to remove skins from peaches and tomatoes. It consists of heating in steam or boiling water, then dipping in cold water for a few seconds. The skins will then slip off easily.

Spinach may also be subjected to this process to shrink it and preserve colour.

A wire basket, large strainer or a square of cheese cloth may be used to simplify handling.

STERILIZE JARS

This may be done while the Fruits or Vegetables are being prepared. Wash in soapy water, rinse, half fill each jar with water and stand on the rack in the boiler. Surround with cold water, bring to boiling point, boil fifteen minutes. Keep them boiling hot until ready to fill. Never touch the inside of a sterilized jar with an unsterile object.

FILLING JARS

When packing work as quickly as possible. Corn, beans and spinach should be packed fairly loosely to allow perfect penetration of heat to the centre of the jar and thus insure even sterilization. Pack the jar full, then fill with boiling liquid. After filling dip the blade of a knife in boiling water and run it down and around the inside of the jar to remove air bubbles. Adjust rubbers (which have been dipped in boiling water) and tops. Then partially seal. With wire clamp jars adjust the top clamp but do not spring down the lower one. With screw top jars screw tight—then unscrew half turn. On vacuum jars adjust metal clamps.

SYRUP FOR FRUITS

Thin syrup 1 C. sugar to 2 cups water.
Medium syrup 1 C. sugar to 1 cup water.
Heavy syrup 1 C. sugar to ½ cup water.

Stir together and boil 5 minutes. For pint jars of large fruit allow about 1 cup of syrup. For pint jars of small fruit about ½ cup.

CANNING FRUIT WITHOUT SUGAR

All fruits may be successfully canned without sugar. Use boiling water instead of syrup. Add 5 minutes to time of sterilization given in the time table.

BRINE FOR VEGETABLES

Allow ½ tsp. salt to each pint jar and fill to over-flowing with boiling water. For Tomatoes use strained Tomato Juice.

PROCESSING OR STERILIZING

I. Steam Pressure Cooker.—The pressure canner is a strongly built container fitted with a clamped on cover. A small amount of water placed in the canner boils forming a pressure of steam the temperature of which varies with the pressure.

At 5 lbs. pressure the temperature is 228°F.
At 10 lbs. pressure the temperature is 240°F.
At 15 lbs. pressure the temperature is 250°F.

For each 2,000 feet of altitude one pound of pressure must be added. Be sure that sufficient water is added. Allow steam to escape from the open pet

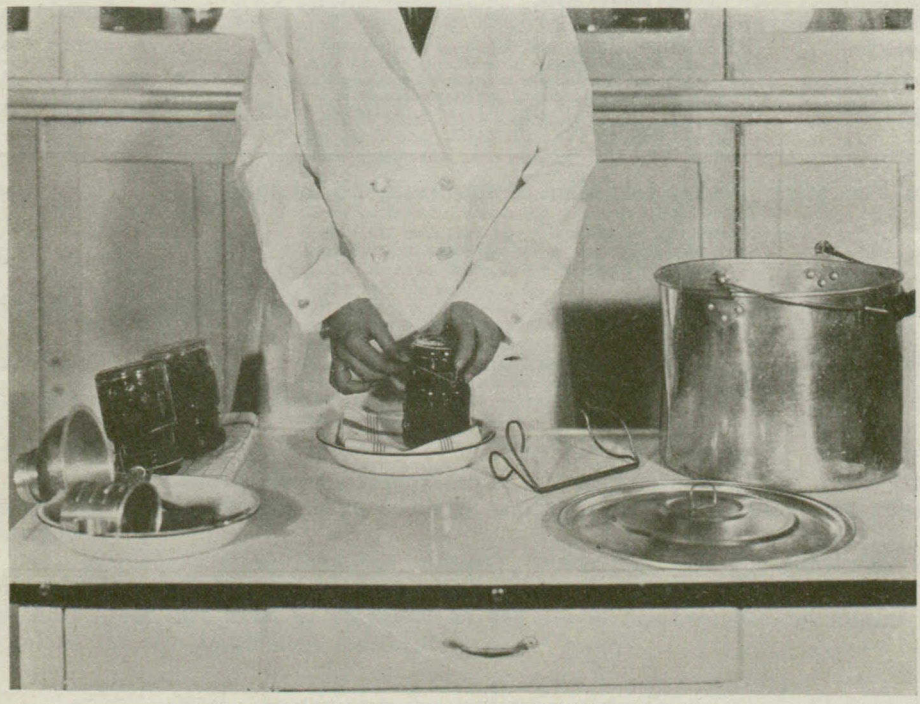
cock at least 3 min. then close and allow pressure to rise until gauge registers required pressure. Count time of sterilizing from this time. When sterilized sufficiently—cool until gauge registers zero then open pet cock SLOWLY. When jars are removed seal at once and invert.

II. Water Bath.—Fill water over the jars 2 inches. Have water near the temperature of the filled jars. Count time of sterilization from the time the water boils. Keep water boiling. As soon as time is up remove the jars and seal at once and invert.

III. Oven.—Place jars 2 inches apart on a tray in heated oven. Temperatures are given in table at back of book.

IV. Steam Cooker.—Place jars on the rack in the cooker. Be sure to add plenty of water. Be sure that water is boiling and steam rising before placing jars. Count time of sterilization from 3 minutes after putting cover on cooker. This method requires longer sterilization period. Remove jars—seal and invert.

Never Open a Jar After Sterilizing.—Sometimes the contents of a jar will shrink in processing leaving space at the top of the jar. This is due to air spaces left in packing the jars, but the entire contents is sterile and will keep perfectly. Opening may allow bacteria to enter and contaminate the product.



Seal jars immediately after removing from the sterilizer. Invert to cool.

WHY FRUITS FLOAT IN THE JAR

1. Overprocessing.
2. Too heavy syrup.

STORING

Before storing wipe jars dry. Be sure there are no leaks. If a leak is found, remove the cover, put on a new rubber, seal and sterilize ¼ time allowed for the particular product. Store in a cool, dry, dark place or wrap each jar in

paper. The cartons in which new jars are packed make a very satisfactory storage place for filled jars.

TIME TABLE FOR FRUITS

Products	Preparation	Sterilization			
		Hot water bath 212°F	Steam pressure 5 lbs.	Oven	Steam cooker
		Minutes	Minutes	Minutes	Minutes
Apples, sliced or quartered	Pack in jars—cover with thin syrup	30	10	50 at 275°F	35
Applesauce	Pack hot	12	5	.....	15
Apricots	Peel—Halve and pit—pack—cover with boiling thin syrup.	20	10	35 at 275°F	30
Blackberries or Blueberries	Wash—pack, fill with boiling medium syrup	20	10	35 at 275°F	30
Cherries	Wash—stem—pit and pack—cover with boiling medium syrup.	20	10	35 at 275°F	30
Currants	Wash—stem—pack, fill with boiling heavy syrup.	20	10	35 at 275°F	30
Fruit Juices	Crush fruit—heat slowly—strain—pour into jars.	30	10	50 at 250°F	50
Gooseberries	Wash—pack in jars—fill with boiling heavy syrup	16	10	30 at 275°F	25
Peaches	Immerse in boiling water 3 min.—cold dip—peel—remove pit—pack in jars—add boiling medium syrup.	20	10	35 at 275°F	30
Pears	Pare—halve—remove core—pack—fill jars with boiling thin syrup. If pears are firm, steam 15 min. before packing.	20	10	35 at 275°F	30
Pineapple	Cut in uniform pieces—pack in sterile jars—fill with medium syrup.	30	15	35 at 275°F	35
Plums	Wash—prick skin—pack cold—cover with boiling medium syrup.	20	10	45 at 275°F	30
Raspberries	Wash if necessary—pack in jars—cover with boiling medium syrup.	16	10	30 at 275°F	25
Rhubarb	Wash—cut in small pieces—blanch 1 min.—cold dip—pack. Cover with boiling medium syrup.	16	10	20 at 250°F	25
Strawberries	Wash — stem — fill jars — cover with boiling medium syrup.	16	10	35 at 275°F	25

For larger jars increase time of sterilization 5 minutes.

TIME TABLE FOR VEGETABLES

Product	Preparation	Time of sterilization	
		Hot water bath 212° F	Steam pressure, 10-15 lbs.
		min.	min.
Asparagus	Wash—tie in uniform bundles—stand upright in 2 inches of water. Boil 4 min. Pack hot—add ½ tsp. salt to each pint jar—fill with boiling water.	120	40
Beans, string or wax	Wash—string—cut in desired lengths. Cover with water, bring to the boiling point—boil 4 min. Pack hot—add ½ tsp. salt to each pint jar—fill with boiling water.	180	40
Beets	Wash and cut off tops 2 inches above beet. Boil 15 min. Cold dip—remove skins—pack—add ½ tsp. salt to a pint jar—fill with boiling water.	90	40
Carrots	Use only very young carrots. Wash and boil 5 min. Cold dip—slip off skins—pack—add ½ tsp. salt to a pint jar—fill with boiling water.	120	40
Cauliflower	Wash—separate the flower. Drop into salty water. Let stand ½ hour—cover with water—bring to boiling—drain—pack jars—add ½ sp. salt to a pint jar—fill with boiling water.	60	30
Corn	Cut corn from cobs. Cover with boiling water and bring to boiling point—fill jars, covering corn with boiling liquid—add ½ tsp. salt to a pint jar.	180	60
Chard or Spinach	Wash carefully—steam 5 min.—pack in jars—add ½ tsp. salt to a pint jar—fill with boiling water.	180	60
Mushrooms	Wash and trim—large ones may be cut in pieces. Blanch 5 min. Cold dip very quickly—pack—allow ½ tsp. salt to a pint jar—fill with boiling water.	90	35
Peas	Use only young tender peas. Shell and wash—cover with water and bring to a boil—pack—add ½ tsp. salt to a pint jar—fill with boiling water. Intermittent sterilization is recommended for peas. 60 min. on each of 3 successive days if water bath is used.	180	60
Sweet green or red peppers	Wash—remove seeds—boil 3 min.—cold dip—remove skins—pack—allow 1 tsp. salt to a pint jar—cover with boiling water.	45	30
Pumpkin	Cut in pieces, remove seed and membrane—peel—steam until tender—mash pack.	180	60
Tomatoes	Scald and peel—pack in jars—cover with tomato juice—allow ½ tsp. salt to a pint jar.	22	15

It is not desirable to can Vegetables in jars larger than 1 pint as the time taken for penetration of heat prolongs the time of sterilization and affects vitamins.

It is recommended that the pressure cooker be used for sterilizing all vegetables except tomatoes. While instructions are given for the water bath method, great care must be exercised on account of the ever present danger of spoilage through insufficient sterilization.

SPOILAGE OF CANNED GOODS

The common terms applied to spoiled canned fruit, etc., are that it is "soured" or "moulded."

The term moulded is easily understood. This is one common form of spoilage in canned goods and consists of a growth of mould on the surface. This mould will vary in colour according to kind. The surface of the material is all that is affected. Fermentation may take place in some cases, and a mouldy taste always results.

Yeast fermentation may occur in improperly sterilized canned fruits and while it does not render the material injurious to health yet it imparts a flavour

that is not pleasing. The formation of gas being the result of fermentation this form of spoilage is easily recognized.

Bacterial spoilage usually takes the form of what is known as " flat souring." No gas is formed but the contents of the jar or can develop a sour or rancid odour, and the liquid is generally cloudy.

If any sign of spoilage is detected the entire jar must be discarded as toxins may be present which are extremely poisonous.

Containers for canned goods should be of a size to suit the needs of the household; not so large that the contents cannot be consumed shortly after opening, or deterioration and spoilage may occur.

It is a wise precaution to boil canned vegetable products for a few minutes after they are removed from the jar. This does not imply that they must be eaten hot. When the vegetables are required for salads, etc., they may be set aside after boiling and chilled before use.

CANNING FRUITS FOR EXHIBITION PURPOSES

Prize winning canned fruits are those which not only have the best appearance but also the best flavour. The following recipes will give the desired results for the reason that the fruit (except strawberries) is not cooked but only sterilized, and are recommended not only for exhibition work but also for everyday canning when an especially good product is desired. The only essentials are care and a reliable thermometer. Success depends largely on the slow raising of temperature.

General Directions

1. Use sound, firm, uniformly sized fruit.
2. Pack the fruit into the jars as tightly as is possible without damage, and to slightly above the top.
3. Fill the jars to the top with cold syrup.
4. Partially seal the jars and place them on a false bottom in a suitable vessel.
5. Surround the jars with *cold* water and heat to the given temperatures in the given times.
6. Remove the jars from the hot water and seal tightly. Invert to cool.
7. When cold shake the jars gently to distribute the fruit evenly.

Special Directions

Sweet Cherries.—White cherries make a more attractive pack than the coloured varieties, and may be put up whole or pitted. Use light syrup. Heat to 170°F. in 1½ hours and hold at that temperature for 10 minutes.

Raspberries.—Use medium syrup and heat to 175°F. in 1½ hours.

Gooseberries.—Snip off the stalk and blossom ends. Use light syrup. Heat to 165°F. in 1½ hours and hold at that temperature for 10 minutes.

Blueberries.—Use medium syrup, and heat to 170°F. in 1½ hours holding at that temperature for 10 minutes.

Strawberries.—Cover berries with an equal weight of sugar and let stand overnight. With as little stirring as possible bring to a boil then remove from the stove and let stand 10-12 hours. Heat again to boiling, remove from the stove and, using a perforated spoon, take the berries from the syrup and place in sterilized jars, filling the jars a little more than three parts full. Cover the jars and then quickly strain the syrup. Bring the strained syrup to boiling and

fill the jars immediately, sealing each jar as it is filled and keeping the syrup at the boiling point. Invert the jars to cool and when cold shake lightly to distribute the fruit evenly.

The surplus syrup may be used for jelly, using liquid pectin.

Red or White Currants.—Remove the fruit from the stalks very carefully, wash and drain several times to remove loose pieces of blossom. Use medium syrup and sterilize at 165°F., bringing the water up to that temperature in 1½ hours and holding at 165°F. for 10 minutes. For Black Currants use the same method but heat to 170°F.

Plums.—Slightly under-ripe plums should be used, as ripe plums tend to split. Prick the plums with a fine copper wire or silver fork and pack as tightly as is possible without damage to the fruit. Use medium syrup and sterilize, bringing the water up to 165°F. in 1½ hours and holding for 10 minutes.

Pears.—Use dessert pears at the firm ripe stage. Peel, halve and core and drop the halves into weak brine (3 tablespoons salt per gallon of water) to prevent browning. Layer the fruit neatly into jars and fill with medium syrup. Sterilize at 185°F., bringing the water up to that temperature in 1½ hours and holding for 20 minutes.

SCORE FOR HOME CANNED PRODUCTS

Appearance		50
Colour—(Intensity, evenness and clearness)	20	
Pack—Uniformity of size and shape	10	
Liquid—Proportion of solids and liquid	10	
Fullness and neatness	10	
Texture		15
Flavour		35
Total		100

THE SALE OF HOME CANNED PRODUCTS

If home canned products are to be sold out of the province in which they are made, a permit must be obtained from the Fruit Branch of the Department of Agriculture. All such products offered for retail trade must comply with regulations under the Meat and Canned Foods Act.

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